be congratulated that we have here one more volunteer who devotes himself, regardless of time and money, to the accumulation of the data needed for its advancement.

The Weather Bureau has, of course, assisted to the extent of its legal privileges by furnishing the expedition with apparatus, and it is hoped that Mr. Baldwin's enthusiasm will be rewarded, not only by a sight of the Polar Region, but by a fine collection of meteorological records.

NOTES FROM THE REPORTS OF THE CLIMATE AND CROP SECTIONS.

KENTUCKY.

Some excellent selections are given from Mr. Milton Whitney's article on climatology in a recent number of Science. The Editor has contemplated some remarks on this subject as he thinks that Professor Whitney's article ignores those features of the climate that affect animal life and human industry and considers only that narrower branch of the subject which might be called vegetable or agricultural climatology. The extracts published in the Kentucky report very discreetly avoid too narrow a definition of climatology. The development of plant life varies with the nature of the plant and the soil quite as much as it does with the climate; it would be impossible to agree as to what plant should be taken as the climatologic standard to which our methods should be adjusted so that the elements of climatology could be worked out by means of it. Climatologists have received with universal accord the ideas disseminated by Professor Hann, and the numerical elements of climatology, which are, perhaps, as many as thirty in number, have already been so widely accepted that it would introduce confusion if we give that word a meaning different from what is now recognized. It seems much wiser for those who are going into very detailed studies in botanical biology to use the term "botanic climatology," under which heading may be included many items relating to the soil that have nothing to do with other branches of climatology.

MARYLAND.

The report for April reproduces a leaflet issued by Prof. Wm. B. Clark, of the Maryland State Weather Service, in which he describes the work of the voluntary reporters in that State and the process of compiling the weekly crop bulletins that are issued before noon of each Tuesday during the growing season.

The work as briefly outlined above, has been continuous in this section since the establishment of the service in 1892. During that time the cooperating observers have increased in numbers and efficiency, and in nearly all cases the same observer has acted continuously since the first enlistment of his services, and his interest in the work has apparently advanced with the length of the record obtained. There are now 70 active voluntary stations in the section, and 100 crop correspondents report regularly during the season. The present status of the work is satisfactory in a general sense, but additional observers are needed in a few districts, and the number of crop correspondents must be increased before the entire territory can be said to be thoroughly represented. It is the desire and intention of the section director to make the Maryland and Delaware section of the Climate and Crop Service second to none in the country, and earnest efforts to that end will be vigorously carried on until a perfect service is firmly established.

MINNESOTA.

The extensive forestal interests of this State make it very important that the art of forestry as it is now understood in Europe, and as it has been so thoroughly exemplified in the writings of Dr. B. E. Fernow, should form a prominent subject in the matter of public education. No State containing extensive forests can afford to neglect this important subject. Attention is called to the fact that the State of New York is now the first on record to move in this important matter. For many years, Dr. Fernow, as Chief of the Division of Forestry in the Department of Agriculture, has urged that the Federal Government take action with regard to the national forest lands. Our Federal policy is liable to vacillate but New York State policy is steadily improving. Dr. Fernow is called to be chief of the college of forestry established at Cornell University by the recent act of the State Legislature "to promote education in forestry and to encourage and provide for the establishment of a college of forestry at Cornell University." Dr. Fernow will have two assistants in the university and the management of 30,000 acres in the Adirondack Forest Preserve, as an object lesson for his students. When men have been properly trained by Dr. Fernow we may hope that they will have the care of all the forests of the State. There can be no doubt but that the expenditure of $2 per acre will bring in a direct net income of $4 or $5 from these lands, and a much larger indirect one. It is not sufficient to merely set aside forests for preservation, we must actually care for them, otherwise they become useless as a source of income and liable to become destroyed altogether by fire.

Other States, such as Maine, New Hampshire, Virginia, the Carolinas, Pennsylvania, Georgia, Michigan, and Minnesota, may well follow the example of New York as to forests and a college of forestry.

NEW JERSEY.

The current report gives several references to the beautiful halo of April 4. This was observed between 8 and 9 p. m., by Prof. R. W. Prentiss, at Rutger's College, New Brunswick, N. J., and John H. Eadie, voluntary observer at Bayonne, N. J., whose reports are given in detail; the fact of its appearance at Bergen Point, Paterson, Boonton, Rancocas, and Camden may also be inferred from the list of dates of lunar halos. A "lunar corona" was reported at Summerville. These points lie in the northern and western half of New Jersey. The halo was also observed to be very brilliant throughout the whole length of New York City. Items regarding halos do not occur in the April report of the New England section, but there can be scarcely any doubt that from the region of Greater New York and the adjoining part of Connecticut, southwestward over northern New Jersey into Pennsylvania, there was during this evening a northeast wind carrying enough moisture to form a steadily increasing haze, which finally became a thick cloud of ice needles, followed by snow during the night. Before the haze was thick enough to entirely obscure the moonlight, and while the ice needles preserved their original delicate prismatic shapes, and while the moon was high in the heavens, conditions were favorable for the formation of lunar halos at stations that were so located that the moon's rays passed through this hazy cloud of ice prisms.

In answer to several letters the Editor will state, that notwithstanding the beautiful prismatic colors, observers should be careful not to apply the word "aurora" to such halos. The word "aurora" is specifically applicable only to the morning twilight, dawn, or daybreak, and to the aurora borealis, an electric discharge that often resembles the morning and evening twilights in some particulars, but need never be mistaken by a careful observer. The faint halo around the moon, the brilliant circle around the zenith, and the beautiful arch of rainbow colors within the latter circle, as described by several persons in New York City, were all due to the reflection and refraction of moonlight by ice crystals high in the air above the observer, forming incipient snowflakes and preparing for the snowstorm of the next morning. The circle about the zenith as a center, and passing horizontally through the moon is called the parhelic circle; it is due to moonlight reflected to the eye from the vertical sides of prisms that are descending to the earth, point foremost, or with their axes vertical. If the moon is about 30° in angular

elevation above the horizon, then the parhelic circle will appear to have an angular altitude of about 30°, and will rise and fall with the moon; that seen on April 4 was generally rather lower than this. When the moon was in the southeast a brilliant arch of spectrum colors, red within and blue without, appeared to surround it at a distance of 22° on the upper side of the parhelic circle, but nothing was seen below the parhelic circle except faint traces of the other half of this circle around the moon. Where this small circle intersected the parhelic circle the two bright spots called sun dogs appeared.

The whole halo was particularly well defined about 8 p. m. in a misty sky, and it was not seen at all at places far beyond the border of the cloud of fine ice needles.

Popular interest in this phenomenon led to the revival of ancient superstitions and old wives' fables on the part of those who persist in attributing a hidden meaning to every natural phenomenon; but to the common sense of the educated public such a halo simply means that the air is loaded with moisture preparatory to rain or snow. It would be highly creditable to the popular writers in the daily journals if they would persist in disseminating scientific, and opposing the mystic, interpretation of all such natural phenomena.

PENNSYLVANIA.

The April report contains a timely article by G. M. Powell on the importance of forest culture.

It is easily recognized that the growth of forests produces a different climate within the forest from that which existed on the open land before the forest grew up; but this is not what is ordinarily meant by the influence of forests upon climate. Similarly the destruction of a forest entirely alters the temperature of the air near the soil, and allows the free access of the wind to carry away the moisture that evaporates from the soil; but this, again, is not the influence of forests upon climate, but is simply the difference between the climate within the forest and the climate outside. In one paragraph Mr. Powell cautiously speaks of "the regulation, not increase of rainfall." In another paragraph he says, "forests influence rainfall much more quickly than is commonly supposed." As far as we can make out from the numerous investigations that have been made on this subject, there is no evidence whatever to show that the growth of a forest either increases, or decreases, or regulates, or influences the rainfall from the clouds. There are a few places on the globe where cloudy air driven against mountain sides loses a small fraction of its moisture by deposition of fog particles on leaves and branches, whence the moisture drips to the ground; the quantity of drip increases with the quantity of foliage, but as for rainfall proper, there is no reason to think that it is or can be appreciably affected by the presence of forests.

VIRGINIA.

The April number contains an interesting extract from the Richmond Dispatch of December 27 in which some unknown author gives a very graphic picture of the remarkable results already attained and still further to be anticipated from the electrical battery recently constructed for the physical laboratory at Harvard College. The author's enthusiasm is certainly natural, and yet a conservative mind would, perhaps, not express himself so strongly. Prof. Edwin H. Hall, who is the first assistant in that laboratory, under date of May 31 says:

Professor Trowbridge has had constructed at our laboratory a storage battery of 10,000 small cells, by means of which he can get directly a voltage of about 20,000. By connecting this battery with a large number of condensers in multiple, then connecting the condensers after they are charged, in series, he gets a voltage which runs into the hundreds of thousands, producing a spark about 6½ feet long in air of ordinary atmospheric pressure. I believe that his estimate of the voltage required to produce a very long spark is greater than the estimate of previous experimentors. Of course great things may be discovered with such apparatus, but whether the predictions of the article you send me will be justified remains to be seen.

RECENT EARTHQUAKES.

Prof. T. Scherer, of the College of St. Martial, Port au Prince, Hayti, communicated an account of the earthquake at that place on December 29, 1897, the publication of which was unfortunately overlooked. It was as follows:

On December 29, at 6 hours 32 minutes and 43 seconds a. m., a severe earthquake was experienced at Port au Prince, lasting one minute and thirty-one seconds. The following are the conclusions to be drawn from the curves traced by the Cecchi seismograph at the meteorological observatory of the College of St. Martial.

The entire phenomenon consisted of five consecutive shocks, the total duration of which was forty-eight seconds, and of a series of feeble movements very perceptible to an attentive observer. The first shock lasted eight seconds; it began from east-northeast and ended from west-southwest. The vertical component was quite strong at about the fifth second. The movement immediately began again, with more force in the horizontal direction and less in the vertical; this lasted eleven seconds, and the direction from which it came was more toward the east. The third shock lasted three seconds, and was characterized by a very regular oscillatory movement. The fifth shock was the strongest, lasted ten seconds, began from the northeast, and died away in the southwest with a vertical component that was scarcely appreciable. All the other movements (after the forty-eighth second) were feeble, with the same horizontal direction. During all this time the seismic pendulum described eclipses in the sand, whose major axes varied from northeast through the south to southwest. The Bertelli microseismometer was for a long time agitated, and finally maintained a north-south direction.

The same earthquake, and with the same features, was felt throughout the neighborhood of Port au Prince. It seems to have also been very violent in the interior of the island of Dominica.

Under date of May 12, Prof. T. Scherer writes further:

It seems to me that there is an error of date in your account of the earthquake attributed to the 15th of December, 1897, at Santiago, in the Republic of San Domingo. (See the December number of the MONTHLY WEATHER REVIEW, page 542.) I have a report of this earthquake by Dr. Llenas, Minister Plenipotentiary from the Republic of San Domingo to Hayti, who was at Santiago at the time. He gave me a detailed account of the earthquake that occurred at about 6:30 a. m., December 29. The details are very nearly the same as given in the MONTHLY WEATHER REVIEW, but no earthquake took place before the 29th of December. The earthquake at Santiago accords very closely with that at Port au Prince, a report of which I sent you with my meteorological record for December.

The Editor regrets the delay in publishing Professor Scherer's report on the earthquake of December 29. He is unable to explain the apparent error in the MONTHLY WEATHER REVIEW, but it is altogether likely that the record for December 15, on page 542, should be credited to December 29. We may, therefore, conclude that the earthquake on the morning of that date was felt most severely throughout San Domingo, but very appreciably also at Grand Turk and Port au Prince.

Prof. E. W. Morley, of Cleveland, Ohio, reports that there was no seismic disturbance there during the month of April. There was also none recorded by the Marvin seismograph at the Weather Bureau, Washington, D. C. The following are reported elsewhere:

April 14.—San Francisco, slight; first at 10:53, and second at 11:07. Eureka, two shocks, 10:50 p. m. and 11:10 p. m.; the second was the heaviest for many years. Sacramento, nothing felt or heard. Oakland, two slight shocks at 11:10. Light shocks were noticed as far south as San Jose and up to Port Costa. Mendocino, first at 10:45, then slight vibrations until the most severe shock, at 11:10 p. m., followed by light shocks throughout the night. Considerable damage done throughout Mendocino County. Point Arena, first shock 10:54; severe quake at 11:09 p. m., continuous shakes until 9 a. m. the next day. Napa, slight shock at about 11:30. Christine, 10:50 p. m., violent, followed by many light shocks for three days. The earth is said to have trembled more or less during the whole of the subsequent week throughout